

A New Species of the Genus *Eupsilia* from Taiwan, with Descriptions of the Genital Organs of Japanese Congeners (Lepidoptera, Noctuidae)

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Introduction

The Holarctic genus *Eupsilia* HÜBNER, [1821], has hitherto been known to contain nine species in the Palaearctic region, especially in the temperate zone of eastern Asia. Most of them were definitely diagnosed by BOURSIN (1956) and SUGI (1958), and their male genitalia were also described in detail. In this paper, I will describe a new species of the genus from Taiwan, and in this occasion I will also illustrate and describe the genitalia and their associated organs of both sexes of the Japanese species.

Description of a New Species

Eupsilia virescens sp. nov.

(Fig. 1)

Head and lateral side of palpus olive green; patagium olive green, with a thin pale marginal line; tegula olive green; legs with brownish tint, clothed with olive green hairs; each tibial segment ringed with pale yellowish gray; abdomen dark fuscous tinged with deep green above, roughly clothed with deep olive hairs at base, pale ochreous beneath.

Forewing with ground color dull olive green; subbasal line thin, black, angled at subcosta; antemedian line thin, black, gently waved; in some specimens, a dark shadow before antemedian line; median line conspicuously thick, dark fuscous, running zigzag, with sharp angles; postmedian line blackish, double, the inner line being thin

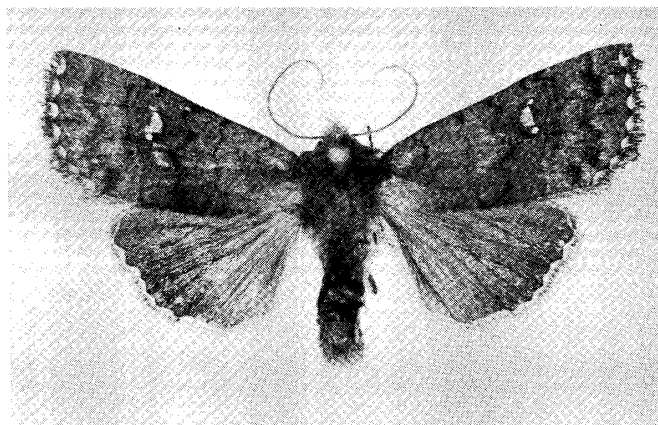
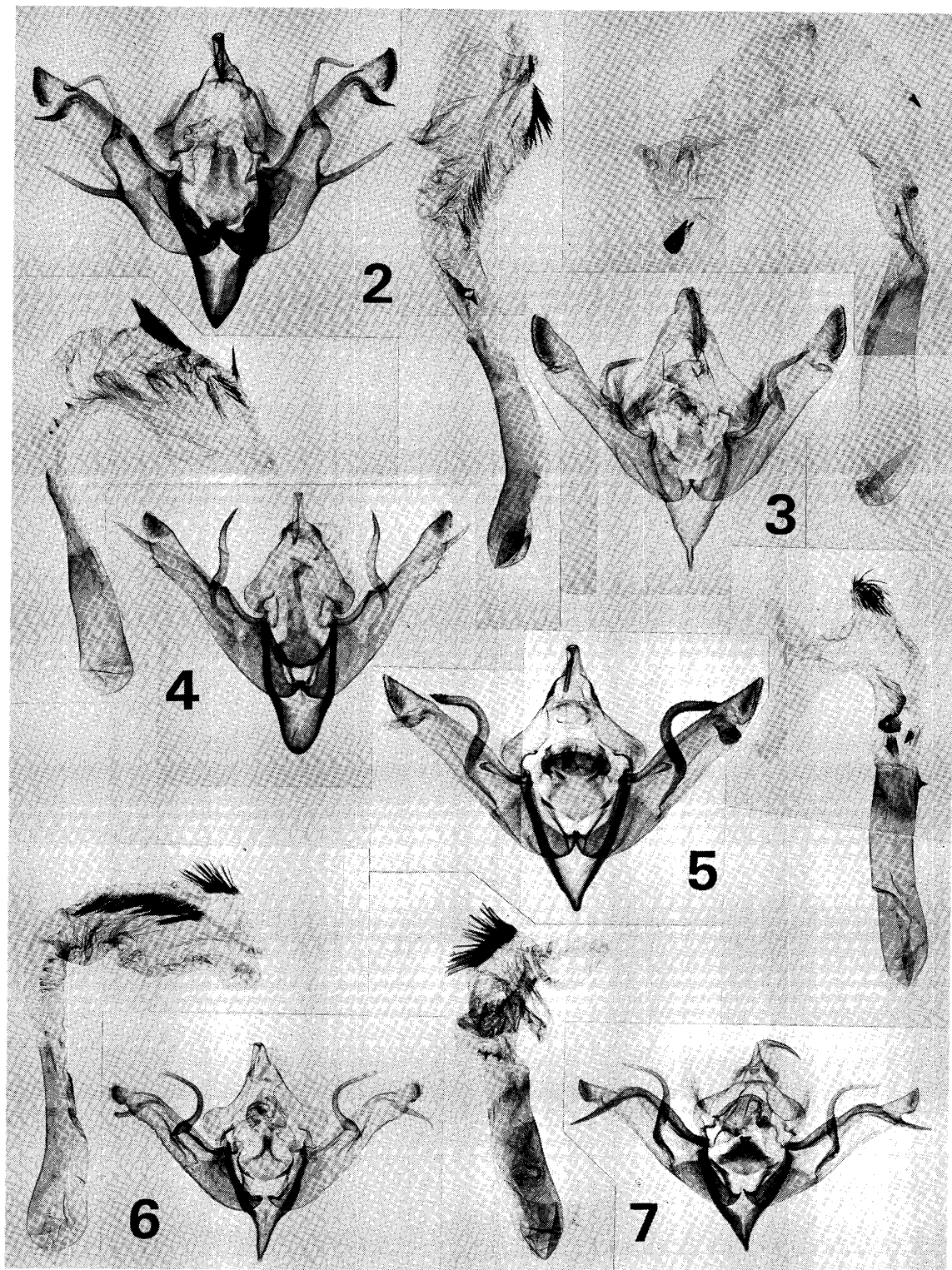


Fig. 1. *Eupsilia virescens* sp. n., paratype ♀.

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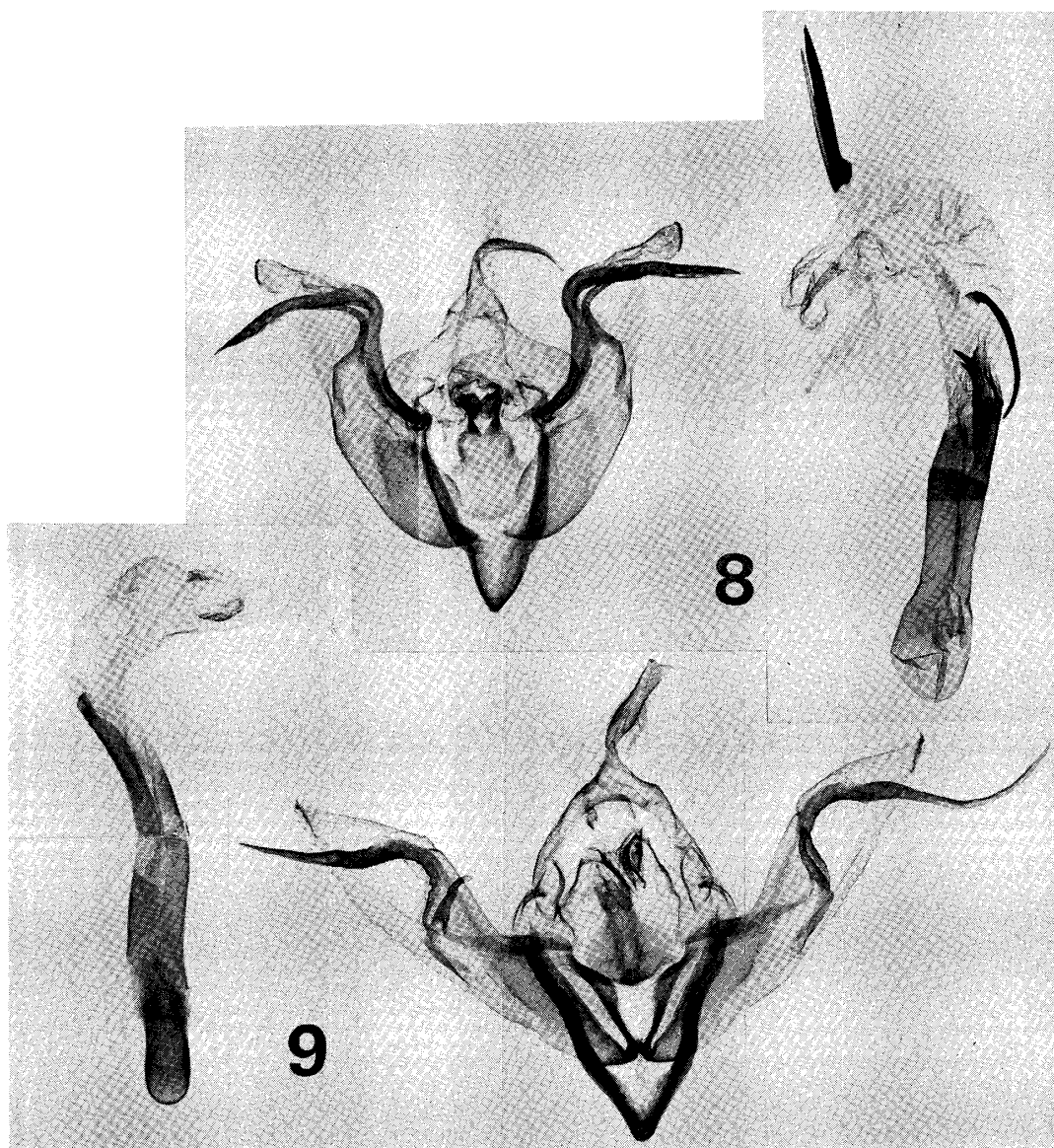
but distinct, and the outer line quite diffuse, arising from costa above discoidal spots, then sliding outwards along subcosta, and running directly to hind margin in a gentle incurved line; discoidal area widely darkened, bearing a lunar discoidal spot, which is



Figs. 2-7. Male genitalia of *Eupsilia* spp. 2: *E. transversa* (HUFNAGEL). 3: *E. unipuncta* SCRIBA. 4: *E. boursini* SUGI, 5: *E. tripunctata* BUTLER. 6: *E. strigifera* BUTLER. 7: *E. virescens* sp. n., paratype.

suffused with orange at middle and accompanied with two minute white dots above and below; subterminal band dark fuscous, diffuse, vaguely edged inside, and its outer margin dentate, widely eroded between veins 3 and 5; terminal line thin, black, crenulate; cilia deep olive green, strongly dentated at veins, with pale yellowish gray lunules at base. Hindwing dark fuscous, with an indistinct and bent discoidal bar; cilia grayish fuscous, paler in outer half, with a pale grayish basal line. Underside. Forewing fuscous gray, densely clothed with long gray hairs in and around cell, with subcosta frosted with olive green; outer line diffuse, black, obsolete below vein 5; terminal area widely pale ocherous, with a prominent thin and black terminal line; cilia nearly as in upperside. Hindwing pale ocherous, irrorated with dark grayish scales; discoidal bar gray, incurved; outer line dark gray, gently waved; terminal line thin, black, and disappearing in tornus; cilia nearly as in upperside.

Length of forewing. 15–17 mm (expanse 31–35 mm).



Figs. 8–9. Male genitalia of *Eupsilia* spp. 8: *E. quadrilinea* (LEECH). 9: *E. contracta* (BUTLER).

Male genitalia (Fig. 7). Similar to those of *E. strigifera* BUTLER, 1897, in having somewhat laterally expanded valva which have the nearly same condition of inner armatures as in *strigifera*. Valva with costa arched before cucullus, a costal pollex near base weak; clavus not developed, harpe strongly curved; ampullae nearly symmetrical, spinous; cucullus slightly larger than in *strigifera*, with corona of about ten spines; juxta widened at middle, caudal tip protruded, rod-shaped, with minute granules; vesica clothed in part with minute granular dents, bearing four small conical spines at base and numerous spines in middle.

Male brush-organ (Fig. 15). Weak; STOBBE's gland quite rudimentary; pocket thin, not reaching the end of third segment.

Female genitalia (Fig. 23). Ostium bursae wide, shallow, with its posterior margin well sclerotized; ductus bursae thick and very short; corpus bursae long and oval, posterior area thickly sclerotized, with several small signa set in three or four rows. Seventh tergite (Fig. 31) normal; caudal margin of seventh sternite (Fig. 39) wide and deeply cleft at middle.

Holotype. ♂, Taiwan, Hualien, Tayuling (2600 m), Nov. 10–11, 1983, K. YAZAKI leg., preserved in the National Science Museum (Nat. Hist.), Tokyo.

Paratypes. 1 ♂, the same data as holotype; 1 ♀, the same locality as holotype, March 28–31, 1981, H. YOSHIMOTO leg.; 1 ♂ 4 ♀, the same locality as holotype, March 23–24, 1982, H. YOSHIMOTO leg., slides HY-1000 (♂), HY-1007 (♀). All the paratypes are in my private collection.

Remarks. This new species is easily distinguished from the known palaearctic species of the genus by the deep olive green forewing with an orange discoidal spot. This species seems to be confined the distribution to the high mountainous zone of Taiwan, where the adults appear together with those of *E. strigifera* so far as I know. In male genitalic structures, *E. virescens* is most related to *E. strigifera* BUTLER, 1897, in spite of its ostensible difference from the latter in colorpattern as mentioned in the description.

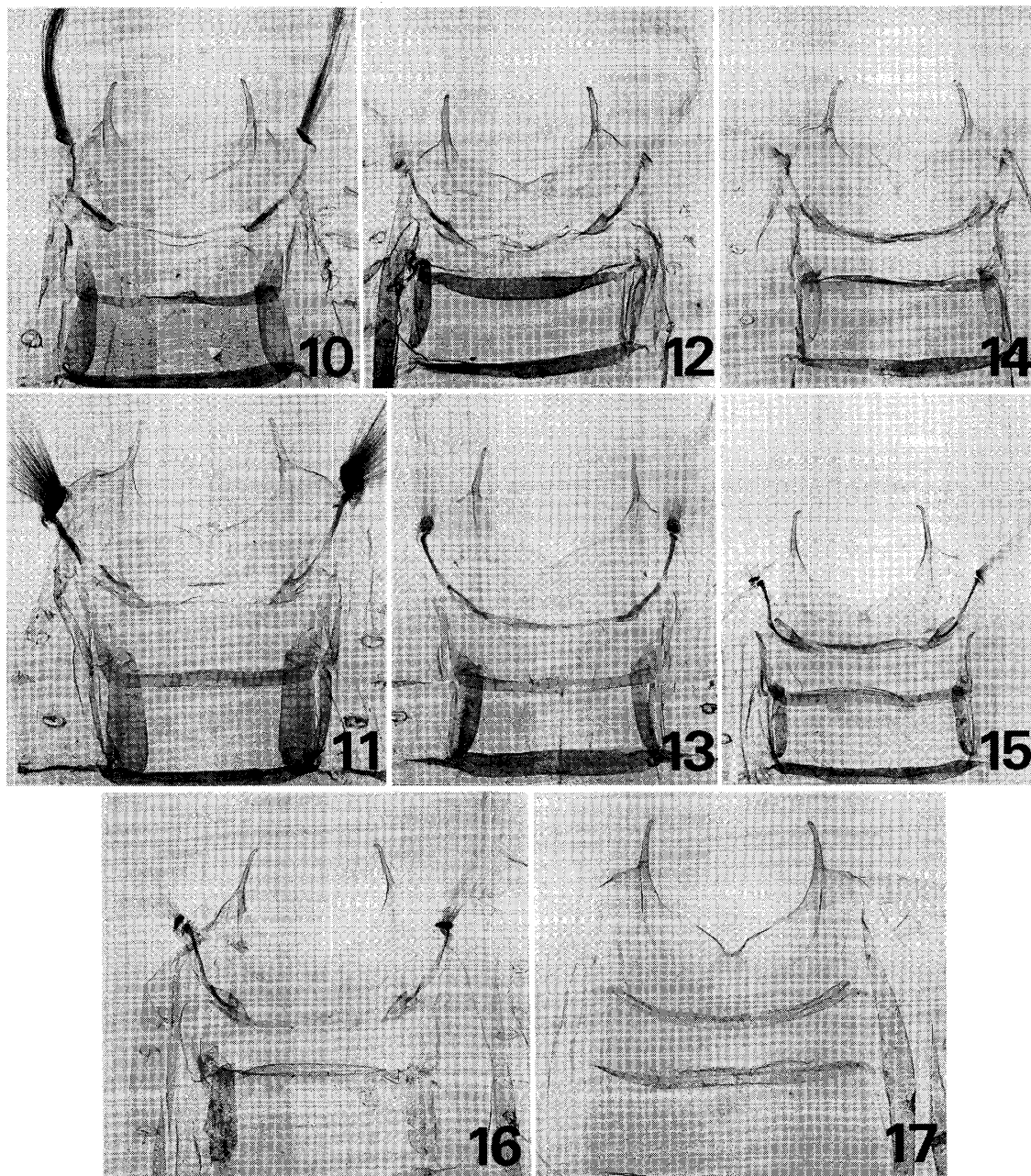
Description of the Genitalia and Associated Organs of the *Eupsilia* Species from Japan and Taiwan, with Some Additional Informations

Genus *Eupsilia* HÜBNER

Male genitalia. Uncus usually simple and its tip normally pointed except for *E. contracta*; penicular lobe developed, heavily hairy in most species other than *contracta*; valva rather slender with both costal and ventral margin nearly parallel to each other as a rule; a small pollex occurring on inner margin of costa before middle in some species; harpe of a stout and generally long projection protruded from the usually long and curved basal belt-like sclerite; ampullae usually spinous, asymmetrical in some species; cucullus moderate or rather reduced, with corona of marginal spines; juxta wide, caudally narrowed in most species; saccus moderate in length, V-shaped in ventral view; aedeagus thick, often with a batch of fine dents near tip; vesica usually well developed, with minute thorn-like cornuti on basal part and numerous spinous cornuti in middle in most species.

Male brush-organ. All the five constituent elements, lever, brush, pocket, apodeme and STOBBE's gland, are recognized in different degrees of development, except for *E. contracta*, which has no trace of each element as shown by KOBAYASHI (1979).

Female genitalia. Papilla analis weakly sclerotized, rather small in comparison with the whole size of genital organ; both apophyses moderate in length; ostium bursae well sclerotized, its opening widened and firmly protected by the seventh sternite; ductus bursae stout, usually elongated; corpus bursae large, ovate in most species, with several signa lined with minute granules. Seventh tergite weakly sclerotized except for



Figs. 10-17. Male brush-organs of *Eupsilia* spp. 10: *E. transversa* (HUFNAGEL). 11: *E. unipuncta* SCRIBA. 12: *E. boursini* SUGI. 13: *E. tripunctata* BUTLER. 14: *E. strigifera* BUTLER. 15: *E. virescens* sp. n., paratype. 16: *E. quadrilinea* (LEECH). 17: *E. contracta* (BUTLER).

contracta; posterior margin of seventh sternite shallowly or deeply concave at middle.

Eupsilia transversa (HUFNAGEL, 1766)

Male genitalia (Fig. 2). Illustrated and described by BOURSIN (1956). Distinct from other members in having a stout and spinous projection arising from sacculus; vesica with two stout thorn-like spines at base, numerous long spines associated with fine spines beyond middle, and three short spines before tip.

Male brush-organ (Fig. 10). All the elements well developed, with large and long pocket extending to the posterior margin of third segment.

Female genitalia (Fig. 18). Ostium bursae moderate in depth, with a rectangular bottom, its posterior margin strongly protrude; ductus bursae long, gently curved, dilated on posterior one-third; corpus bursae large, long-oval, its posterior part caudally elongate and thickly sclerotized, and anterior membranous part bearing four longitudinally long signa lined with minute granules. Seventh tergite (Fig. 26) normally sclerotized; seventh sternite (Fig. 34) shallowly concave on posterior margin, with a well sclerotized oval patch in its center.

Distribution. Wide spread in Eurasia, from Europe to Japan via China.

Early stage. In Japan, there is no field survey, but the larvae are known to feed on cherry and other broad-leaved trees (SUZUKI & SAITO, 1972; YAMAMOTO, 1975), and the photographs of the full mature larva were illustrated by YAMAMOTO (1975, 1978).

Eupsilia unipuncta SCRIBA, 1919

Male genitalia (Fig. 3). Illustrated and described by BOURSIN (1956) based on the holotypes of *E. unipuncta* and *E. sodalis* DRAUDT, 1950, a junior synonym of the former. Characterized by comparatively short harpe and short ampulla which is not extending to the ventral margin of valva; vesica very long, unique in lacking spinous cornutus, but bearing two minute claw-like cornuti near base, one same type of cornutus at basal one-fourth, and two bulbed cornuti before tip.

Male brush-organ (Fig. 11). Most developed among the palaearctic species here mentioned; base of brush enlarged and pocket wide, very long, and reaching the posterior end of third segment.

Female genitalia (Fig. 20). Apophysis anterioris a little shorter than in other species; ostium bursae funnel shaped, wide in its opening, then smoothly narrowed cephalad; ductus bursae long, strongly curved, loosely twisted, and its anterior portion turning back to caudal side; corpus bursae large and oval, its posterior part caudally swollen and thickened in the side near ductus bursae; four short signa situated on the anterior membranous part. Seventh tergite (Fig. 27) moderate; the sternite (Fig. 35) weakly sclerotized and very shallowly concave on posterior margin.

Distribution. Japan (central and western Honshu, Shikoku, Kyushu), China (Hunan).

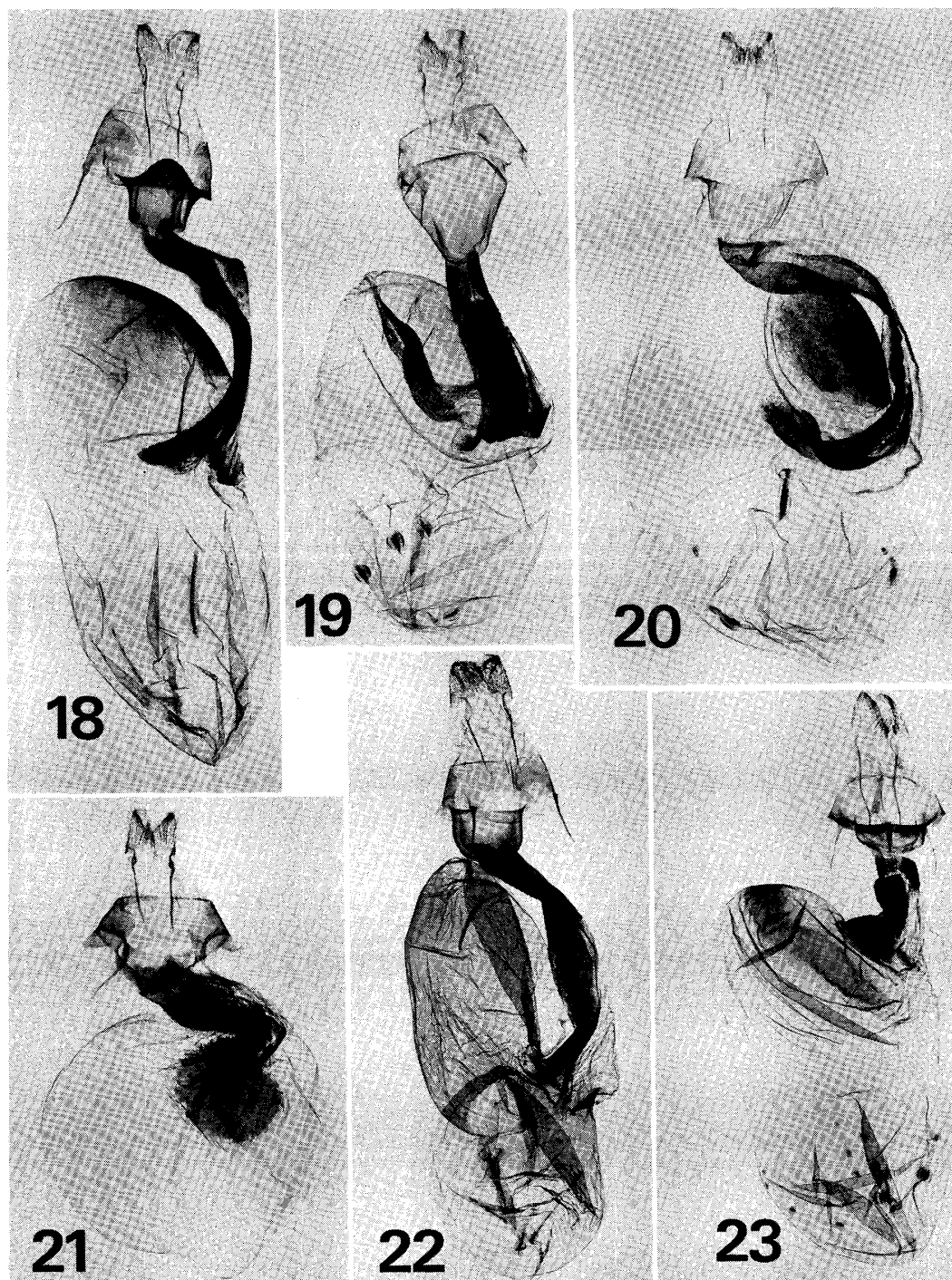
Early stage. Unknown.

Remarks. The moths appear in autumn later than other members of the genus,

probably not emerging before November in Japan.

Eupsilia boursini SUGI, 1958

Male genitalia (Fig. 4). Illustrated and described by SUGI (1958). Characterized by acute harpe and ampulla and by three or four minute dents on ventral margin of



Figs. 18–23. Female genitalia of *Eupsilia* spp. 18: *E. transversa* (HUFNAGEL). 19: *E. boursini* SUGI. 20: *E. unipuncta* SCRIBA. 21: *E. tripunctata* BUTLER. 22: *E. strigifera* BUTLER. 23: *E. virescens* sp. n., paratype.

valva below ampulla; aedeagus without caudal scobination; vesica with four minute spines on proximal part, numerous long spines in middle, and a row of seven or eight spines beyond them.

Male brush-organ (Fig. 12). Brush weak; pocket rather small-sized, its posterior tip not reaching the end of third segment.

Female genitalia (Fig. 19). Ostium bursae large, deep, wide at opening, then gradually narrowed anteriorly; ductus bursae straight, thick, but a little thinned in anterior three-fourths; corpus bursae oval, the half of posterior part well sclerotized, with three small signa and one ribbon-like signum visible on anterior membranous part. Seventh tergite and sternite (Figs. 28, 36) much smaller than in other species; posterior margin of the sternite gently concave at middle.

Distribution. Japan (Hokkaido, central to northern Honshu, Shikoku) and USSR (southern Primorye region).

Early stage. The larvae were recently found on *Tilia japonica* SIMK. (SUGI, 1984).

Eupsilia tripunctata BUTLER, 1878

Male genitalia (Fig. 5). Illustrated and described by BOURSIN (1956) and SUGI (1958). Characteristic in distinctly asymmetrical ampullae: left one bluntly bar-like and right one lobed; a stout and thorn-like carina penis at caudal end of aedeagus; vesica with three stout bulbed spines on base and a bunch of numerous thin spines on the median swelling.

Male brush-organ (Fig. 13). Nearly as in *E. boursini*, with pocket somewhat thinner and reaching the posterior margin of third segment.

Female genitalia (Fig. 21). Ostium bursae wide and quite shallow; ductus bursae thickened, rather short, its ventral membrane densely granulated; corpus bursae spherical, lacking signum, with a circularly expanded and sclerotized part around the area conjunctive with ductus bursae. Seventh tergite (Fig. 29) roundish on posterior margin; seventh sternite (Fig. 37) widely sclerotized along posterior margin, where it is deeply concave, with a pair of scaly tufts.

Distribution. Japan (central to western Honshu, Shikoku, Kyushu, Tsushima I.) and China.

Early stage. The larva is well known as a feeder of *Celtis sinensis* var. *japonica* (PLANCH.) NAKAI, and the mature larva was recently illustrated by YAMAMOTO (1978).

Eupsilia strigifera BUTLER, 1879

Male genitalia (Fig. 6). Illustrated and described by BOURSIN (1956). Characterized by wellprotruded clavus and asymmetrical ampullae; aedeagus with a mass of minute dents at end; vesica resembling that of *E. boursini*, but all the types of cornuti more increased in number than in *boursini*.

Male brush-organ (Fig. 14). Weakly developed; STOBBE's gland rudimentary; pocket narrow, short, not extending to the posterior end of third segment.

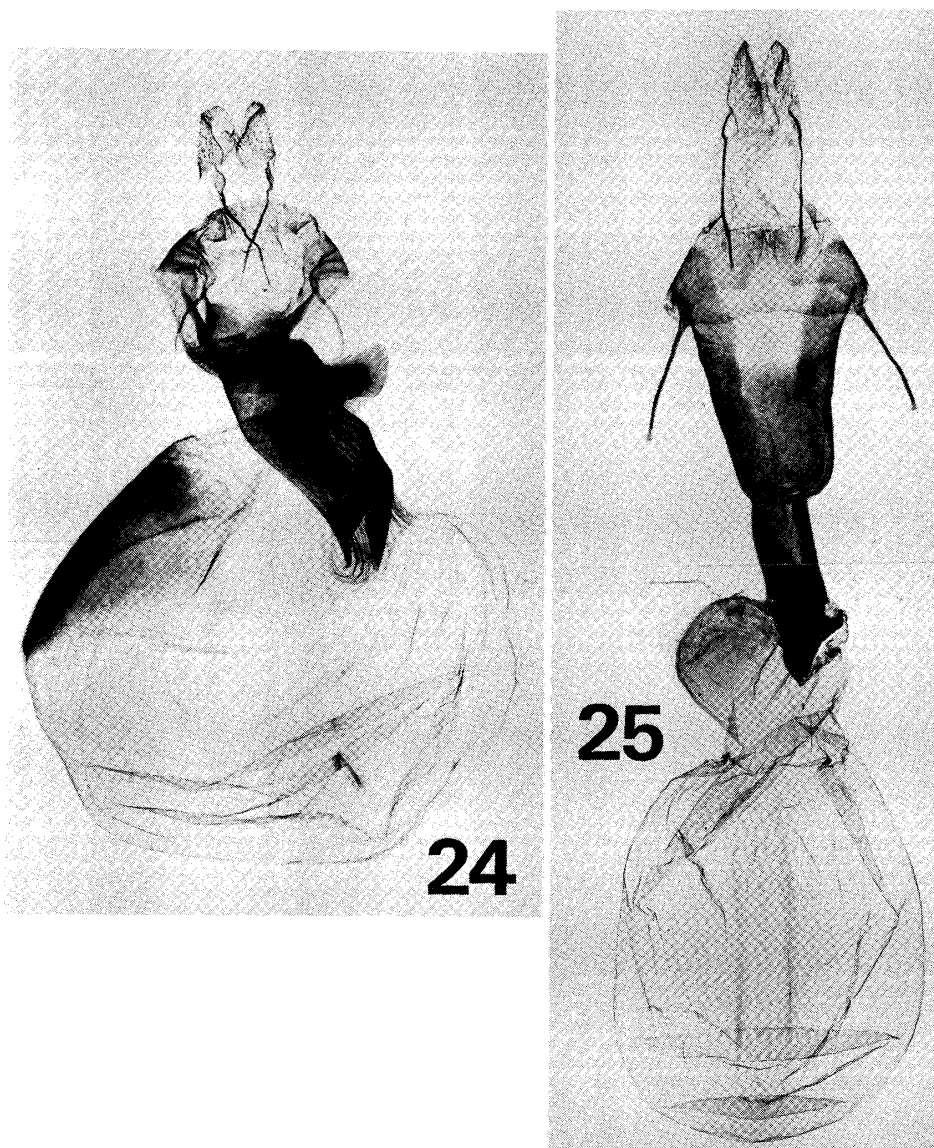
Female genitalia (Fig. 22). Ostium bursae wide at posterior margin, its anterior

margin roundish; ductus bursae elongate, somewhat thinned in middle, gently angulate at posterior one-fourth and at anterior one-fourth; corpus bursae long, posterior portion long and more sclerotized than anterior one, which bears two long and rudimental signa and two or three short ones of minute granules. Seventh tergite (Fig. 30) moderate; the sternite (Fig. 38) roundish, with its posterior margin shallowly concave.

Distribution. Japan (Honshu, Shikoku, Kyushu, Tsushima I.) and Taiwan (new record).

Early stage. Unknown.

Remarks. Recently, I had a chance to examine a male specimen obtained in Taiwan. This is the first record of *E. strigifera* from the island: 1♂, Hualien, Tayuling (2,600 m), Nov. 10–11, 1983, K. YAZAKI leg., slide HY-1086.



Figs. 24–25. Female genitalia of *Eupsilia* spp. 24: *E. quadrilinea* (LEECH). 25: *E. contracta* (BUTLER).

Eupsilia virescens sp. nov.

See the description in the previous pages.

Eupsilia quadrilinea (LEECH, 1889)

Male genitalia (Fig. 8). Illustrated and described by BOURSIN (1956). Valva with costa strongly arched at middle; harpe rather short, ampulla stout and very long; juxta large and its tip bifid, with stout dents on each tip; aedeagus with a small mass of minute dents at tip; vesica with two short and stout spines at base, one thin, long and curved spine beyond them, and two stout and long spines beyond middle; the last-mentioned spines are fused at their bases.

Male brush-organ (Fig. 16). Brush moderate, but STOBBE's gland less developed, rather rudimentary; pocket moderate in size.

Female genitalia (Fig. 24). Ostium bursae quite wide and shallow; ductus bursae thick, with an extra pollex on posterior one-fourth; corpus bursae spherical, widely sclerotized on posterior side, with two short signa, one of them much obsolete. Seventh tergite (Fig. 32) bearing deciduous and special scales along the caudal margin, and the sternite (Fig. 40) deeply cleft and densely clothed with scaly hairs on posterior margin.

Distribution. Japan (Honshu, Shikoku, Kyushu, Tsushima I.).

Early stage. There may be no field survey, but larvae are known to feed on various kinds of trees. The full mature larva was illustrated by JINBO (1969) and by YAMAMOTO (1979).

Eupsilia contracta (BUTLER, 1878)

Male genitalia (Fig. 9). Illustrated and described by BOURSIN (1956). Uncus furcate at tip; peniculus less developed; valva with harpe very short and ampulla quite long; aedeagus bent; vesica with a bunch of weak and short spines on a small hump before tip.

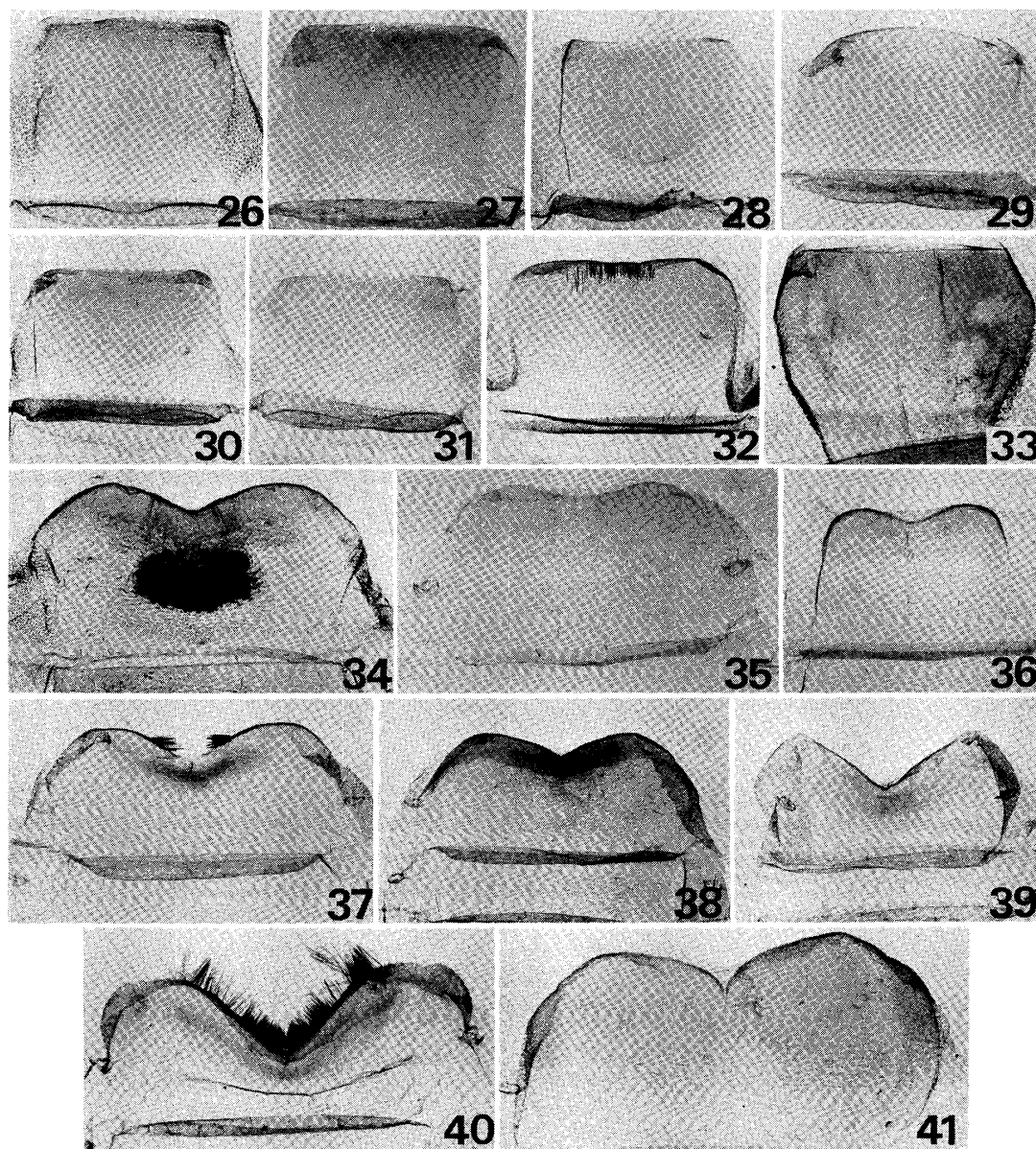
Male brush-organ entirely lacking (Fig. 17).

Female genitalia (Fig. 25). Both apophyses long; ostium bursae very deep, with a wide opening; ductus bursae rather short; corpus bursae long, posterior portion well sclerotized, and anterior portion membranous, long, oval, with two longitudinally elongate signa. Seventh tergite (Fig. 33) well sclerotized, with both lateral sides expanded; seventh sternite (Fig. 41) large, well sclerotized and its posterior margin roundish and concave at middle.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu) and USSR (southern Primorye region).

Early stage. Larvae are known as feeders of *Alnus japonica* (THUNB.) STEUD. (EBATO, 1971; NISHIGAKI, 1971)

Remarks. This species seems to have less affinity to other congeners in the



Figs. 26–41. Female 7th tergites (26–33) and 7th sternites (34–41) of *Eupsilia* spp. 26, 34: *E. transversa* (HUFNAGEL). 27, 35: *E. unipuncta* SCRIBA. 28, 36: *E. boursini* SUGI. 29, 37: *E. tripunctata* BUTLER. 30, 38: *E. strigifera* BUTLER. 31, 39: *E. virescens* sp. n., paratype. 32, 40: *E. quadrilinea* (LEECH). 33, 41: *E. contracta* (BUTLER).

superficial and anatomical features; in *E. contracta*, forewings have smooth termen and well marked orbicular and reniform stigmata; all the elements of the male brush-organ are wanting, and the male genitalia show a modified form, having forked tip of uncus, less-developed penicular lobes, long ampullae, short harpes and rather short vesica. Female genitalia are characteristic in very deep ostium bursae.

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摘 要

台湾産 *Eupsilia* (ミツボシキリガ属) の 1 新種の記載ならびに邦産同属種の雌雄生殖器の記載 (吉本 浩)

旧北区の *Eupsilia* (ミツボシキリガ属) は、最近沿海州より記載された *E. kurenzovi* KONONENKO, 1976 を含めて 9 種知られているが、これまで台湾からは全く記録がなかった。幸運にも私は、1981年、82年の両春、台湾中部の山地帯で本属の未知の 1 種を採集することができ、また東京都瑞穂の矢崎克己氏の1983年秋の採集品中に、同種ならびに *E. strigifera* BUTLER ヨスジキリガの 2 種を見い出すことができた。本報では、この未知種を *E. virescens* sp. n. ミドリミツボシキリガ (新称) として記載するとともに、邦産の同属 7 種の雌雄交尾器を図示、記載した。

この属では、翅斑の他にも雌雄交尾器を中心に種ごとの個性がよくあらわれるが、全体としてよくまとまっている。ただし、*E. contracta* (BUTLER) ウスミモンキリガは、♂交尾器の uncus が先端で叉状をなし、peniculus が膨大しないこと、短小な harpe に対し極めて長い ampulla を持つこと、♂の

brush-organ を欠くこと，♀交尾器の ostium bursae が深く陥入することなど，外観同様（腎，環状紋をよくあらわし，外縁はなめらか）他種にない特徴を有している。

なお，本報で記載した 1 種について簡単に記しておく。

Eupsilia virescens sp. n. ミドリミツボシキリガ（新称）

やや小型．前翅は濃いオリーブ色で中室端の白色斑のうち，中央のものはオレンジ色を帯びる．♂交尾器はむしろヨスジキリガに類似し，♂の brush-organ の状態も同様．

模式産地は花蓮県大禹嶺 (2600 m)．同地では必ずしも稀ではなく，秋～春に得られており，ヨスジキリガ（台湾新記録）と混棲する．